

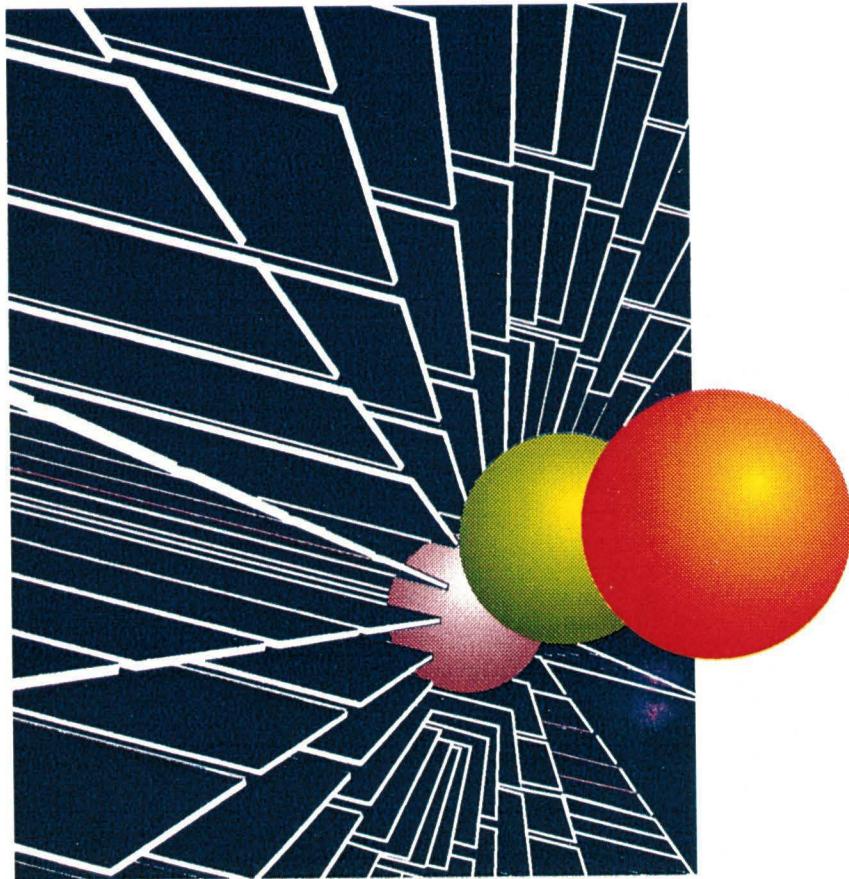
MoDOT

Research, Development and Technology Division

MISSOURI DEPARTMENT
OF TRANSPORTATION

RDT PEER EXCHANGE

Final Report



Conducted at:
MoDOT
1617 Missouri Boulevard
Jefferson City, MO 65102

April 13-16, 1998

**MISSOURI DEPARTMENT OF TRANSPORTATION (MoDOT)
RESEARCH, DEVELOPMENT AND TECHNOLOGY (RDT) DIVISION
PEER EXCHANGE**

April 13-16, 1998

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EXECUTIVE SUMMARY

Excellent input was received by all participants in the MoDOT Peer Exchange for the Division of Research, Development and Technology (RDT). Executive management showed their support by being available for three different sessions with the peer exchange team.

The Senior Management Team provided an overview of their vision of how RDT should function. Research must cut across all areas of MoDOT. RDT should be aggressive in searching for new ways to extend service life and help with asset management. Deployment and implementation are key roles that RDT should focus on. RDT should be included and utilized in the Strategic Planning process of MoDOT. The goal of MoDOT is not necessarily to be first, nationally, in research but be in the first wave.

Discussions with the Technical Review Committee concentrated on improving how RDT interacts with other divisions and district (field) personnel. The need for more technical assistance/consulting to be provided by RDT was emphasized, including timely responses. Personnel in MoDOT should become more involved in research projects by participating in the planning, investigation, and deployment stages. RDT needs to do a better job of marketing what we do.

Representatives from the University of Missouri-Columbia and University of Missouri-Rolla discussed the current contracting relationship. Both universities believed the new directions will be much improved. The university basic agreement with task orders will be a major step in improving the timely approval of contracts. The recent partnership between MoDOT and the universities that establishes the Missouri Transportation Research and Education Center (MOTREC) is another major factor in developing strong working relationships between MoDOT and the two universities, both in research work and continued education.

FHWA representatives encouraged identifying non-traditional funding opportunities for research as well as technology transfer processes. FHWA expressed strong support for MoDOT's research and technology transfer program.

The peer exchange team summarized their comments into key points for presentation to executive management. There are a lot of good things going for MoDOT and the RDT Division: strong support of management; good staff and facilities; strategic plan/business plan alignment; strong FHWA support; positive relationship with Public Affairs; the staff is "open", approachable and easy to work with.

The team stressed that executive management should convey their support for RDT across all of MoDOT. Their support is strong and will be a major element in the success of the division. Executive management should interact more frequently with RDT staff; assist RDT in expanding scope of research into all areas of the department's functions (including non-engineering areas); work closely with RDT to effectively utilize new funds that may be available through NEXTEA; be supportive of RDT in the development of staff, such as building

career paths for professional staff as well as technicians; and aid RDT in consolidating MoDOT research into the one division.

The Administrative team of RDT will review the results of the Peer Exchange and develop an action plan for capturing the opportunities that were identified in this process.

INTRODUCTION

As a condition for receipt of Federal-aid funds for research, development and technology transfer (RDT) activities, States are required to establish a management process including:

- A. An interactive process for identification and prioritization of RDT activities.
- B. Utilization, to the maximum extent possible, of all FHWA planning and research funds set aside for RDT activities.
- C. Procedures for tracking program activities, schedules, accomplishments, and fiscal commitments.
- D. Support and use of the Transportation Information System (TRIS) database for reporting RDT activities.
- E. Procedures to determine the effectiveness of the State's management process and to facilitate peer reviews of its RDT Program on a periodic basis.
- F. Procedures for documenting RDT activities through the preparation of final reports.

As part of its program management, the Missouri Department of Transportation (MoDOT) RDT Division conducted a Peer Exchange for the research program from April 13 through 16, 1998. The Peer Exchange began with an introductory reception and dinner to introduce the Peer Exchange team members to MoDOT Senior Management and RDT staff members.

The Peer Exchange team was composed of research staff members from other state, federal and private research institutes.

Team Members:

Charles Nemmers, P.E.

Director of the Office of Engineering, Research and Development,
Turner-Fairbanks Facility
Federal Highway Administration, Washington, D.C.

Roger Port, P.E.

Technology Transfer/Research Engineer
Region VII Office
Federal Highway Administration, Kansas City, Missouri

Gary Allen, Ph.D., P.E.

Director of Research
Virginia Transportation Research Council, Virginia
Bob Schmiedlin, P.E.

Research Supervisor

Wisconsin Department of Transportation

Larry Senkowski, P.E.

Assistant Division Engineer, Materials and Research Division
Oklahoma Department of Transportation

Bill Duncan, Ph.D.
Director of Strategic Marketing,
Midwest Research Institute, Kansas City, Missouri

Sam Kiger, Ph.D., P.E.
Chairman of Civil Engineering Department
University of Missouri - Columbia

Jim Murray, P.E.
Division Engineer, Research, Development and Technology Division
Missouri Department of Transportation, Jefferson City, Missouri

Wally McKeel, P.E. (Observer)
Research Manager
Virginia Transportation Research Council, Virginia

Staff Member Participants:

The following staff members participated throughout the peer exchange:

Ray Purvis, Assistant Division Engineer
Keith McGowan, RDT Director/Program Administration
Patty Brake Lemongelli, RDT Director/Research
Don Davidson, RDT Director/Development
Jim Radmacher, RDT Director/Technology Transfer
Mark Schroyer, FHWA Division Office, Technology Transfer Engineer

RDT STAFF DISCUSSION

The participating RDT Staff joined by the following additional RDT Staff participated in a session to describe the Division's Strategic Plan, Business Plan, staffing structure, budget, State Planning and Research (SPR) work program, current operation practices and publications and the primary points of the peer exchange:

Vince Imhoff, Sr. R & D Engineer
J.D. Wenzlick, Sr. R & D Engineer
Ron Middleton, Sr. Research Analyst
Manda Brandt, Intr. R & D Assistant
Jason Shafer, Intr. R & D Assistant
Nelson Cook, Field Testing Technician

Implementation Opportunities from the RDT Staff Discussion:

- Research must sell results...the operating divisions must implement.
- Ivan is a champion of projects...he takes the time to demonstrate and sell the innovation and technology.

- Not all "good" research is implementable NOW...many reasons come into play.
- Requires outstanding communication skills
 - * Know your customer
 - * Utilize project panels with broad representation
- More Advisory Committees with broader representation
- Advisory Committees for customer subject areas.
 - * Construction
 - * Maintenance
 - * Traffic
 - * Planning
 - * etc.
- Cultural differences in focus of researchers and customers are potential barriers
 - * Progress reports/time to complete
 - * Field visits/division visits
- Research must create a pull environment
- Starting to win the battle requires fulfilling the technical assistance and consulting needs of MoDOT first. It isn't clear that this is given priority.
- You can't separate marketing from implementation.

AGENCY REPORTS

Members of the peer exchange team also shared operations from their respective agencies.

Wisconsin DOT

Uses Technical Oversight Committees
 Activities governed by Council on Research
 Each Project has a Project Monitor (Principal Investigator) and a Project Sponsor
 Leverage funds with Private Industry, Universities and Contractors Involvement

Oklahoma DOT

Each Project must have a Division Level Sponsor
 Projects selected by Research Area Activity Committees (RAAC)
 RAAC for Operations and Preliminary Engineering
 Holds Annual Research Conference
 Staff person dedicated to Implementation Tracking of Research Results
 Involves Industry as a Research Partner

Virginia Transportation Research Council (VTRC)

Shared Facilities between DOT and University
 Leverage University Staff with DOT Staff
 Involves Industry
 At least 25% of Time dedicated to Technical Assistance to Customers
 Uses Co-Investigators for Contract Research
 Uses Customer Satisfaction as their primary Performance Measure

Midwest Research Institute (MRI)

Uses an On-Going Customer Survey Form

Contractor for numerous previous and current NCHRP Studies

Manages the Department of Energy Laboratory in Golden, Colorado

FHWA Turner-Fairbanks Facility

Transportation Industry Research on the National Level

SENIOR MANAGEMENT TEAM DISCUSSION

The following members of the Senior Management Team were interviewed to discuss topics including management's expectation of the RDT Division, budgeting of special projects as well as the primary points for the peer exchange:

Joe Mickes, Chief Engineer and Chief Administrative Officer
J.T. Yarnell, Deputy Chief Engineer
Mike Golden, Chief Operating Office
Bob Sfreddo, Assistant Chief Engineer, Design
Dave Snider, Assistant Chief Engineer, Operations
Al Laffoon, Division Engineer, Bridge
Sue Muck, Division Director, Public Affairs

The following representatives also participated in this session from the FHWA Division Office:

Allen Masuda, Division Administrator
Karla Snyder-Petty, Assistant Division Administrator

Major points from the Senior Management Discussion:

- Emphasize implementation, practicality
- Research must cut across all areas
- Align research with MoDOT Cost Centers/Business Plan/Strategic Plan
- Transfer/implementation from National/International Programs
- RDT must "push" TRC
- Develop/maintain strong relation with districts/divisions
- Pay your way and link costs/benefits
- Focus on Asset Management
- Keep us informed about improvements we can use (Technology Scanning)
- Involve more MoDOT employees from all areas of the department in the research program
- Must be able to show the public the benefits of RDT (need a marketing plan)
- Need a public outreach program so districts will care about research and create an ownership of research results

- Be aggressive in looking for projects to extend service life and help with asset management
- Maintain contact with Bob Sfreddo, who should pass information to executive level
- Continue memo/research summary memos to top management
- Focus on practical, usable, implementable results
- Need timely new product evaluations for specific application (Technical Assistance)
- Concentrate on deployment within the department, less inventive research
- Research should look for the new solutions, better or best practices
- RDT should be included and utilized in the Strategic Planning
- Focus on projects with high potential for savings
- Optimize research opportunities through other agencies
- RDT should support a 5 year horizon
- MoDOT is not going to do ITS research
- MoDOT will not be first in research but we will be in the first wave

TECHNICAL REVIEW COMMITTEE (TRC) DISCUSSION

The following TRC representatives discussed the current TRC structure and purpose and their role relative to the primary points of the peer exchange:

Larry Brenner, Construction Division
 Tom Johnson, Operations, District 1
 Tom Keith, Materials Division
 Kent Van Landuyt, Planning and Policy Work Group
 Jerry Shipman, Multimodal Operations Division

Opportunities for Improving TRC Role

- Hard to get feedback--we have to ask it
- RDT must sell themselves
- Districts don't know what is happening in Research
- Feeling is that most of what RDT does is far in the future
- The process takes too long for short term needs

TRC Ideal World

- Devoting person to maintenance research has been great (Ivan)
- Need research staff with field knowledge and who will champion new ideas
- For planning, we are interested into economic, quality of life, socio-economic area--expand this
- Get area engineers involved

- Construction area needs immediate, timely consulting/technical assistance from RDT
- 99% of people in districts don't know about RDT
- No process of accountability for implementation of recommendation
- RDT must have vision and push TRC into new areas and SELL IT (co-sponsor)
- T2 is very important for multimodal
- Tracking and feedback to customers

UNIVERSITY DISCUSSION

Representatives from the University of Missouri-Columbia and the University of Missouri-Rolla discussed current contracting relationships between the Universities and MoDOT, a previous university cooperative meeting, current basic agreement and work orders for future contracting, solicitation of NCHRP contracts and the newly formed Missouri Transportation Research and Education Center (MOTREC).

Sam Kiger, UMC
 Mark Virkler, UMC
 Mike Barker, UMC
 Bryan Hartnagel, UMC
 Tom Petry, UMR
 Charles Morris, UMR
 Tony Nanni, UMR

Opportunities resulting from the University Discussion:

- Research and education are closely linked--support for graduate students--1.5 to 2 year horizons are great
- Can do quick response on selective basis
- Great potential for joint use of lab facilities
- University would like to see more partnering of faculty, RDT staff, and graduate students as Co-PI's (MOTREC)
- Extend intern program to applied research
- Encourage more communication between PI and RDT/MoDOT
- Make implementation plan a part of workplans
- MoDOT very responsive in moving from research concept to approval
- Very interested in applied research and service to the state
- Perhaps explore opportunities for faculty to work on design teams at MoDOT and MoDOT staff to teach as Adjunct Faculty
- Very pleased with level of interaction in last 2-3 years
- T2 piece very important
- Other state agencies should come to MoDOT before going to university on transportation issues

- MOTREC - Missouri Transportation Research and Education Center
 - * Partnering MOU between MoDOT, UMC, ROLLA for training, education and research (also LTAP/T2)
 - * Offers numerous opportunities for NCHRP, other funds, large grants, courses for continuing education, and creating a true center for research
 - * Fosters communication and trust
 - * Touch the base that overcomes the question of being a "grant" program for university

FHWA DISCUSSION

Identifying non-traditional funding opportunities, technology transfer opportunities, review of the annual SPR work program were topics discussed with the following FHWA Division Office representatives:

Karla Snyder-Petty, Assistant Division Administrator
 Dave Edwards, Planning/Research Team Leader
 Mark Schroyer, Research/T2/Safety Engineer

FHWA Discussion Points

- Separate RDT division is a plus
- SPR work program is well organized, on time
- MoDOT has a balance of unspent funds in 086 funds
 Opportunities here: travel, technology transfer, video conferencing, MOTREC, pool funded studies
- Let RDT know about special funds opportunities

BULLET POINTS FOR PEER EXCHANGE REPORT

Strengths of MoDOT RDT Division/Program

- Executive Management Support
- Core Internal Staff
- The physical facility is a visible show of support and a selling point.
- Management Team at RDT appears strong.
- Business Plan/Strategic Plan alignment
- University Relationship
- Starting with a clean slate--opportunity
- Top Management Vision
- Top Management message that you need a seat at the strategic planning table (an opportunity)

- Strong FHWA support/partnering--division office is flexible
- Area engineers offer great opportunity link for district liaison with RDT.
- Structure is good (Research, Development, T2)
- Business Plan
- Positive Relation with Public Affairs, etc.
- Diverse experience of staff
- Leadership of RDT
 - Example: The Focus Group Meetings for Strategic Planning
- Organization is new--opportunity to think outside box
- Staff is "open"--approachable, easy to work with
- Ivan is an excellent role model
- Staff has willing attitude to learn and accept change
- The MoDOT environment of change can offer great opportunity to RDT.
- Public Affairs likes you!! Don't underestimate value of this.
- RDT wants to succeed.
- Mercury Team Model Change
- RDT is "New and Improved"
- MOTREC has great potential to aid RDT/Partner

Opportunities for the Division

- Improve communications with District/MoDOT personnel through out organization. (Project Tracking)
- Build grassroots support
- Be responsive to top management goals
 - * 5 Year Horizon
 - * Broaden scope outside engineering
 - * Optimize best practices
 - * Scan what's available nationally
 - * Maintain technology
- Enhance customer focus
 - * Technical Assistance/Consulting
- Expand Advisory Committee Process
- Improve National Networking
- Develop roles/mechanisms of people involved in program to deliver program (ex. role of Area Engineers)
- Role NEXTEA plays (external)
 - * Effective use of money
- More input from Districts on their needs/problems
- Expand the Ivan model
 - * Deployment/Implement
- Become a technology service office
 - * Give people something to improve ways of doing business
- Staff development for new areas, networking (training, travel, etc.)

- Establish library and information service (Internet, electronic, etc.) (Critical part of consulting, technical assistance)
- Role of TRC needs work
 - * Composition, expectations, responsibilities, mechanics
- Take advantage of student employees
- Be proactive in providing technology/best practices
- What is the RDT program? (Are you really driving the bus?)
- More fully develop role of university.
 - * MOTREC
 - * Interns
 - * Library
 - * Student help
- Expand relationship/use of Public Affairs (declare yourself the best)
- Do some quick easy successes
- Say what you're going to do up front as an annual goal and do it.
- Consider private sector resources/outsourcing
 - * Extra staff
 - * Extra expertise
- Career ladder improvements
 - * Technicians
 - * Research staff
 - * Dual ladders of advancement
- Better way to prioritize work
- Be timely problem solvers
- How can RDT leverage program outside Mo.
- Get people outside MoDOT involved in program
- Distribution of funding among RDT
- Alternative Procurement devices
- Effective use of funds (\$1M)
- Get feedback from Customers
 - * Satisfaction
- Make the business plan a living plan
- Take advantage of the independence of districts
- Top management needs to support RDT throughout MoDOT
- Where RDT is positioned in MoDOT matters

Observations From MoDOT Peer Exchange

Larry Senkowski

Oklahoma DOT

The Missouri Department of Transportation (MoDOT) has made some dramatic changes within the past few years. The process that was chosen and the results that are in place are very impressive. Quantum change such as the creation of the Research, Development and Technology

(RDT) Division and renaming the Central Office to Support Center are clear evidence of out-of-the-box thinking and provides a unique foundation to build upon. I am looking forward to relating the changes that are going on at MoDOT to management at ODOT. The role that MoDOT's upper management has taken in providing the vision and making changes is a model of a successful process.

Upper management has a clear vision and has enabled the creation of solid structure for the RDT function. However, the Technical Review Committee seems to be unaware of this vision and therefore they are not proactive in the program.

Upper management recognizes the potential of the RDT Division and can see the need to involve and utilize RDT in developing and carrying out MoDOT's strategic plans. Following through on this idea is critical to a progressive program.

Asset management and government in the same sentence is a classic example of an oxymoron. Traditionally, transportation departments have been good builders. However, continuous review, evaluation, and action are necessary preventative maintenance activities for efficiency and effectiveness of any program. Upper management needs to be the farmer of the program, not only planting the program but provide the workers and nurturing of the fields. Corporate culture is changing but much nurturing is needed to provide common vision and cooperation throughout the organization.

- Excellent start, good people, good structure, good vision, good strategic issues, however, action plans are missing.
- Communication needs to be facilitated to promote involvement in the program and to increase expectations.
- Direction was clearly given for opportunity in the area of maintenance, and utilization of the management systems.
- Customer base needs to be expanded beyond traditional customers.
- Cooperative efforts with universities as well as private entities should be encouraged.
- RDT needs to involve customers without inconveniencing them and this can be facilitated through the support of RDT personnel.

We Listened To What "Top Management" Said

Charlie Nemmers, FHWA

- Look for hurdles in 5 year horizon
 - * Expand RDT areas
 - * Set up Advisory Committees in subject areas
- Proactive in Best Technology
 - * Search for Best Practice
 - * Leverage Ivan Model

- Do Maintenance RDT
 - * Communications w/District (especially maintenance foremen/workers)
 - * Leverage NCHRP - Pool Funds
 - * Get on TRB Committees
- Solve Problems Timely
 - * Better tech/info search (library-internet)
 - * Use all of MoDOT to deliver solutions
 - * Use universities
- Better Decision Tools
 - * Asset Management
 - * Analysis Models
 - * Data collection/survey tools (lasers, videos, etc.)
 - * System issues (Life Cycle Costs)

KEY POINTS FOR MODOT EXECUTIVE MANAGEMENT

- Convey support for RDT across all of MoDOT.
- Executive management should continue to communicate their vision for RDT.
- Executive management can greatly aid the innovation and technology program by giving more access and interacting more frequently with RDT staff.
- Universities offer MoDOT great continuing education and staff development opportunity. They can help move MoDOT RDT to a national reputation and leverage staff resources and expertise. This will take executive level effort and continuing support.
- Take steps at executive management level to expand scope of RDT program into non-engineering areas to address broader customer base.
- Executive management needs to work closely with RDT to effectively use additional funds likely to come from NEXTEA. The 086 funds balance offers opportunity to jump start the program into other key emphasis areas of need to MoDOT.
- A strong RDT program requires strong support for staff development. This includes assuring a career path for RDT staff and technicians that is attractive and encourages people to become very good at technology development and deployment. Networking with other states, technical groups, TRB, etc. is a key.
- Work of RDT can make MoDOT more effective in conveying benefits to the public. To do that requires devotion of resources from Public Affairs Office.
- Aid RDT in consolidating MoDOT research into the Research Division.

